



FACT SHEET

FOUR COUNTY LANDFILL STATE CLEANUP SITE DELONG, FULTON COUNTY, INDIANA

OPERABLE UNIT TWO (OU2) PROPOSED PLAN JANUARY 2001

YOU ARE INVITED

The Indiana Department of Environmental Management is holding a public meeting to accept written and oral comments from the public on the proposed plan for the second operable unit at the Four County Landfill Site.

DATE: January 17, 2001
TIME: 7:00 pm to 9:00 pm
PLACE: Aubbeenaubee Community Bldg.
7171 West Olsen Road
Leiter's Ford, Indiana

Public Comment Period:

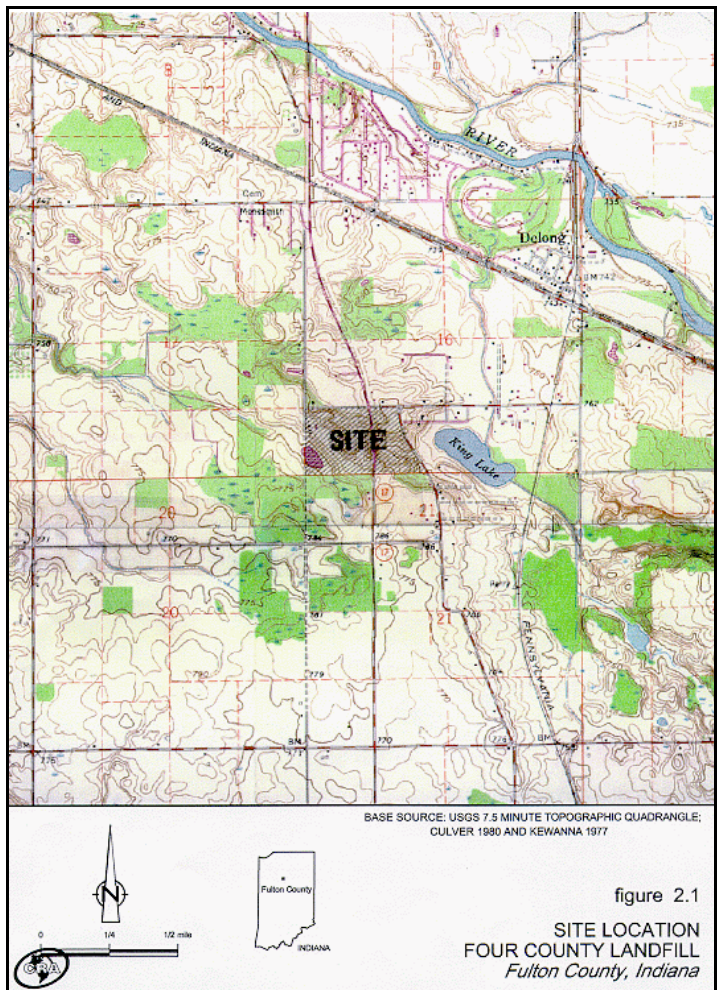
IDEM will accept written comments regarding this proposed plan and other site documents during the public comment period:

January 8 to February 7, 2001

Introduction:

This Proposed Plan (PP) describes alternatives for the second operable unit at the Four County Landfill. It also explains and evaluates all of the alternatives considered by IDEM. The alternatives summarized in this PP are described in the Operable Unit 2 Feasibility Study (OU2 FS) report. The OU2 FS report and other site documents are in the Administrative Record and

Information Repository, and contain in-depth details on the development and evaluation of the alternatives considered by IDEM.



The completed Operable Unit One (OU1) Remedial Action and OU2 Remedial Action together will comprise the total remedy for the site.

Public comment on the PP and the supporting information is important to the remedy selection process. Based on new information or public comments, IDEM may modify the recommended alternative or select other alternatives in the Proposed Plan. The public is encouraged to review the technical reports and provide comments on all alternatives considered for OU2 at the Four County Landfill Site.

Site Description and History:

The Four County Landfill site occupies 61 acres 0.7 mile southwest of Delong, Fulton County, Indiana. The area where wastes were deposited occupies less than 30 acres. The landfill owner began accepting municipal solid waste for disposal in 1972. Wastes were disposed of in unlined pits and covered with backfill. In 1973, the Indiana State Board of Health sent the landfill owner a notice to stop dumping barrels of waste solvent.

In 1978, EWC, Inc. was formed to operate the landfill and the Indiana State Board of Health approved the landfill to accept industrial wastes including plating sludge, asbestos and liquids. After EWC, Inc. submitted Part A of a permit to treat, store or dispose of hazardous waste in 1980, the landfill received interim status under the Resource Conservation and Recovery Act (RCRA). During the time period from 1982 until 1986, repeated violations of RCRA were noted. As a result, IDEM referred the landfill site to U.S. EPA in October 1986.

In 1986 and 1987 three lined cells were constructed on the site to hold hazardous wastes. Some of the older wastes were excavated and placed in the new cells. In June 1987, U.S. EPA determined that the Four County Landfill site had released hazardous substances into the environment. In 1988, a civil suit was filed by the United States against EWC, Inc. for RCRA violations. Later, the citizen group, Supporters To Oppose Pollution (STOP), joined in the

lawsuit. The Federal District Court for the Northern District of Indiana ordered the landfill closed in March 1989 and assessed fines of \$2.78 million. Subsequently, EWC, Inc. hired a contractor and attempted to comply with the Closure Order. During 1991, work was stopped due to financial difficulties and eventual bankruptcies of the landfill owners, and the site was abandoned.

In November of 1991, IDEM hired a contractor to properly collect and dispose of leachate produced in the three lined cells and to conduct maintenance activities for the site. In August of 1993, a group of potentially responsible parties (PRPs) and IDEM entered into an Agreed Order to conduct site maintenance activities, identify the nature and extent of contamination (Remedial Investigation/RI) and provide alternatives for cleanup of the landfill (Feasibility Study/FS). This "Group" of PRPs are primarily comprised of waste generators that arranged to have their wastes transported to the landfill.

In November 1998, a group of PRPs entered into an Agreed Order with IDEM to perform the Remedial Design/Remedial Action (RD/RA) for the first Operable Unit (OU1) at the Four County Landfill. Construction of the OU1 RA was completed in December of 1999.

The Operable Unit Approach:

In order to expedite the site cleanup, IDEM is using an operable unit approach at the Four County Landfill. Operable units are a number of separate activities undertaken as part of a site cleanup. The operable unit strategy allows remedial activities to take place while the investigation for the complete remedy continues. Operable Unit One addressed the landfill cap. Operable Unit Two addresses groundwater. Operable Unit Two includes characterization of the nature and extent of groundwater impacts off-site, and the installation of a selected remedy which will adequately address off-site groundwater contamination.

OU2 Remedial Investigation Summary:

The OU2 RI was completed in June of 1999. The RI was conducted in order to determine the nature and extent of groundwater impacts beyond the landfill boundary. The results of the investigation indicate that a narrow plume of Volatile of Compounds (VOCs) impacted groundwater has migrated from the site. The plume extends approximately 900 feet from the northern landfill boundary and follows the groundwater flow path in a north/northwest direction (see Figure 1). Several VOCs were identified during the investigation, primarily benzene, carbon tetrachloride, vinyl chloride and 1,2-dichloroethane (1,2-DCA). The major VOC contaminant, 1,2-DCA, is confined to depths of 120 - 130 ft. below the ground surface down gradient (north/northwest) of the site.

IDEM, the Fulton County Hazardous Substances Committee and the PRP "Group" have monitored private residential water wells in the area since the remedial investigations for both operable units have begun. The latest residential well monitoring event was conducted in August of 1999 by IDEM. To date, none of the private residential wells tested have shown any VOC impacts.

The PRP Group prepared OU2 RI and FS reports which outline several alternatives for groundwater clean up. IDEM reviewed the RI and FS reports during the Fall of 2000 and subsequently approved them on January 4, 2001.

Summary of Site Risks:

A risk assessment was conducted to determine potential human health risk from OU2. The risk assessment determined that there are potential human health risks from contact with contaminated groundwater at OU2, with 1,2-DCA driving over 90% of the estimated risk. The OU2 risk assessment is presented in Appendix L of the OU2 RI report, which is available for review at the Aubbee Branch of the Fulton County Public Library.

Summary of Remedial Alternatives:

The OU2 FS report identified and evaluated alternatives that could be used to address threats

to human health from groundwater at OU2. The Remedial Action Alternatives (RAAs) developed for off-site groundwater are summarized below. There are two ex-situ (out of ground) and three in-situ (in ground) RAs that are described.

The Remedial Action Objectives (RAOs) are the cleanup goals for OU2 that include:

- Prevent ingestion of and direct contact with groundwater that may have cancer risks in excess of the U.S. EPA target range.
- Prevent inhalation of vapors emanating from groundwater that may have cancer risks in excess of the U.S. EPA target range.
- Minimization of potential migration to surface water bodies.
- Reduction of site related contaminants to Safe Drinking Water Act (SDWA) Maximum Contaminant Levels (MCLs).

Several components were common to all of the remedial action alternatives:

- Deed Restrictions and Groundwater Use Restrictions
- Groundwater Monitoring
- Residential Water Treatment (Contingency)

Alternative 1 - No Further Action

Estimated 30-year present worth cost: None

Estimated implementation time frame:

Immediate

Estimated time to reach RAOs: None

IDEM is required by federal law to include the no action alternative in order to provide a basis for comparison with the other alternatives. The no action alternative consists of doing no further remedial activities at OU2. It does not address potential human health risks from OU2 groundwater and does not achieve Applicable or Relevant and Appropriate Requirements (ARARS) [Environmental Laws].

Alternatives 2 and 3 share the following common components:

- Deed and groundwater use restrictions
- Groundwater monitoring
- Residential water treatment contingency

Alternative 2a - Groundwater Extraction with Air Stripping and Surface Discharge or Subsurface Injection

Estimated 30-year present worth cost: \$ 5.2 mil

Estimated implementation time frame: 1 year

Estimated time to reach RAOs: 18-27 years

In addition to those common components noted above, this ex-situ treatment alternative consists of:

- pH adjustment and chemical precipitation to reduce metals concentrations
- treatment of contaminated groundwater by air stripping
- piping, electrical controls, and instrumentation
- construction of a treatment system building

Treated groundwater would then be discharged to the surface or injected into the subsurface.

Alternative 2b - Groundwater Extraction with Granular Activated Carbon (GAC) Treatment and Surface Discharge or Subsurface Injection

Estimated 30-year present worth cost: \$8.9 mil

Estimated implementation time frame: 1 year

Estimated time to reach RAOs: 18-27 years

This alternative would be the same as Alternative 2a with the exception that groundwater would be treated using GAC instead of by air stripping. Treated groundwater would then be discharged to the surface or injected into the subsurface.

Alternative 3a - Monitored Natural Attenuation

Estimated 30-year present worth cost: \$840,000

Estimated implementation time frame: 6 months

Estimated time to reach RAOs: 30 years

In addition to those common components noted above, this in-situ treatment alternative includes:

- the installation of a performance monitoring, point of compliance and sentry monitoring well network
- preparation of alternative remedial action contingency plans
- installation of point of use filters at residences that show site related contaminants in their drinking water as a contingency.

Alternative 3b - Enhanced Biodegradation

Estimated 30-year present worth cost: \$1.9 mil

Estimated implementation time frame: 6 months

Estimated time to reach RAOs: 28 years

In addition to those common components noted above, this in-situ treatment alternative includes:

- installation of injection wells
- introduction of inert compounds that promote and encourage the growth of micro-organisms that biodegrade the compounds of concern
- introduction of oxygen-releasing compounds that promote biodegradation of the compounds of concern

Alternative 3c - Biosparging

Estimated 30-year present worth cost: \$2.1 mil

Estimated implementation time frame: 6 months

Estimated time to reach RAOs: 28 years

In addition to those common components noted above, this in-situ treatment alternative includes:

- installation of sparge points/injection wells
- injection of air or oxygen with low levels of methane or propane to enhance biodegradation of compounds of concern

Evaluation of Alternatives:

IDEM used the 9 criteria described below to evaluate the alternatives. An evaluation table comparing each alternative against these criteria is also provided below.

1. Overall Protection of Human Health and

the Environment address whether a remedy provides adequate protection and describes how risk posed through each pathway is eliminated, reduced, or controlled through treatment, engineering controls, or institutional controls.

2. Compliance with Applicable or Relevant and Appropriate Requirements (ARARS) addresses whether a remedy will meet all other Federal and State environmental statutes and/or provide grounds for issuing a waiver.

3. Long-Term Effectiveness and Permanence refers to the amount of risk remaining at a site and the ability of a new remedy to maintain reliable protection of human health and the environment, over time, once cleanup goals have been met.

4. Reduction of Toxicity, Mobility, or Volume Through Treatment is the anticipated performance of the treatment technologies that may be employed in a remedy.

5. Short-Term Effectiveness refers to the speed with which the remedy achieves protection, as well as the remedy's potential to create adverse impacts on human health and the environment that may result during the construction and implementation period.

6. Implementability is the technical and administrative feasibility of a remedy, including the availability of materials and services needed to implement the chosen solution.

7. Cost addresses the estimated capital and operation and maintenance costs, as well as a present worth cost. Present worth is the total cost of an alternative in terms of today's dollars.

8. Support Agency Acceptance indicates whether, based on its review of the FS report and the PP, the support agency (in this case the USEPA) concurs with, opposes, or has no comment on the recommended alternative.

9. Community Acceptance will be assessed in the Record of Decision (the document that outlines the selected cleanup plan) following a review of the public comments received on the

FS report and the PP.

Recommended Alternative for Operable Unit Two:

The recommended alternative for the operable unit two remedy is Alternative 3a Monitored Natural Attenuation. The evaluation table of the Nine Criteria located on the following page, shows the best alternatives would be alternatives 3a, 3b and 3c. All three alternatives would fully meet the nine criteria except for short-term effectiveness. Alternative 3a is less expensive than alternatives 3b and 3c, yet the time frame to reach the RAOs is slightly longer. Alternative 3a provides the best balance of trade-offs with respect to the Nine Criteria.

IDEM proposes to have MNA implemented at the site in accordance with U.S. EPA guidelines to the fullest extent practicable. The U.S. EPA has published guidance documents that focus on the natural attenuation of chlorinated solvents such as 1,2-DCA (the primary contaminant of concern).

U.S. EPA guidance stresses the importance of source control whenever MNA is implemented as a site remedy. The remedial action taken as part of OU1 (capping of the landfill) serves as source control. The wastes beneath the landfill have been permanently isolated by the landfill cap such that surface water can no longer contribute to the mobilization of contaminants beneath the landfill which eventually migrate from the site with the groundwater.

During the OU2 RI, data was evaluated according to a U.S. EPA scoring model to confirm that natural attenuation processes were taking place. Based upon the results of the evaluation, there is adequate evidence that biodegradation (a natural attenuation process) of the site related groundwater contaminants is taking place. Biodegradation refers to the process in which subsurface microbes utilize the contaminant as a food source, thus transforming the contaminant into a non-hazardous end product. The biodegradation process at OU2 is also referred

Operable Unit 2 Alternatives Table

Evaluation Criteria	Alternative 1 No Further Action	Alternative 2a Groundwater Extraction with Air Stripping and Surface Discharge or Subsurface Injection	Alternative 2b Groundwater Extraction with GAC Treatment and Surface Discharge or Subsurface Injection	Alternative 3a Monitored Natural Attenuation	Alternative 3b Enhanced Biodegradation	Alternative 3c Biosparging
1. Overall Protection of Human Health and the Environment	☐	■	■	■	■	■
2. Compliance with ARARS	☐	■	■	■	■	■
3. Long-Term Effectiveness and Permanence	☐	●	●	●	●	●
4. Reduction of Toxicity, Mobility, or Volume Through Treatment	☐	■	■	■	■	■
5. Short-Term Effectiveness	■	●	●	●	●	●
6. Implementability	■	●	●	■	■	■
7. Cost (in millions)	None	\$5.2	\$8.9	\$0.84	\$1.9	\$2.1
8. Support Agency Acceptance	USEPA is not acting in the role of support agency for the Four County Landfill Site Cleanup Site. However, USEPA may comment on the OU2 Proposed Plan.					
9. Community Acceptance	Community acceptance of the recommended alternative will be evaluated after the public comment period.					

Notes:

- ☐ Does not meet criteria
- Fully meets criteria
- Partially meets criteria

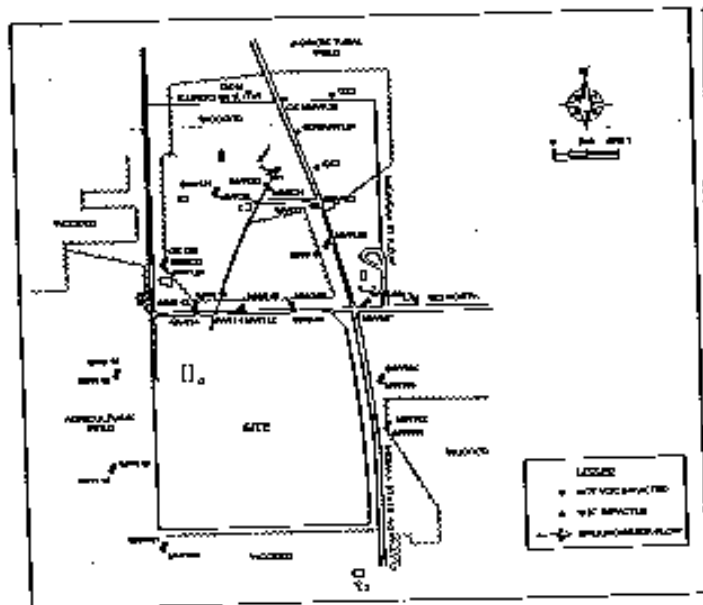


Figure 1. Groundwater screening boring and monitoring well locations with general groundwater flow direction

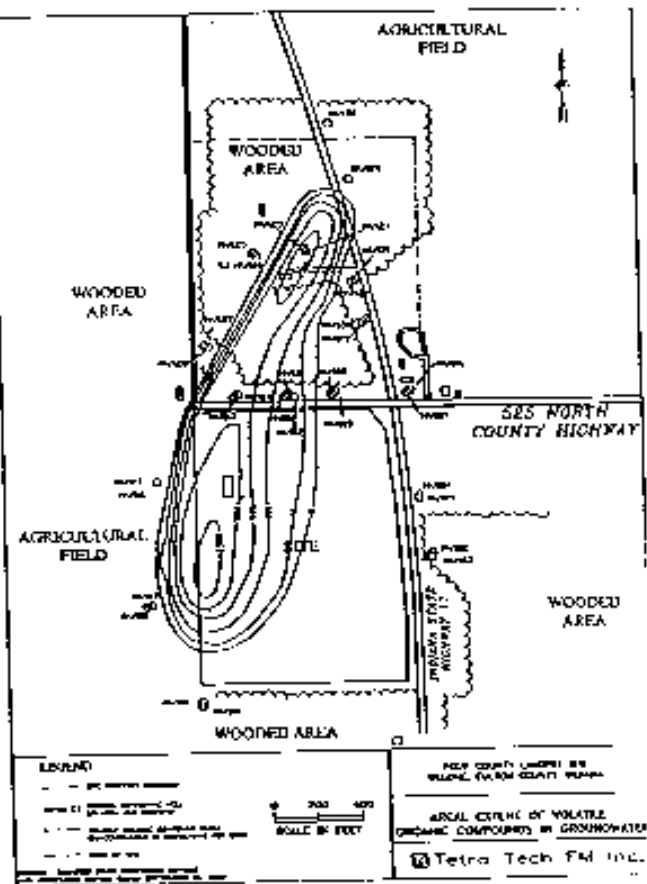


Figure 2. Aerial Extent of VOCs in Groundwater

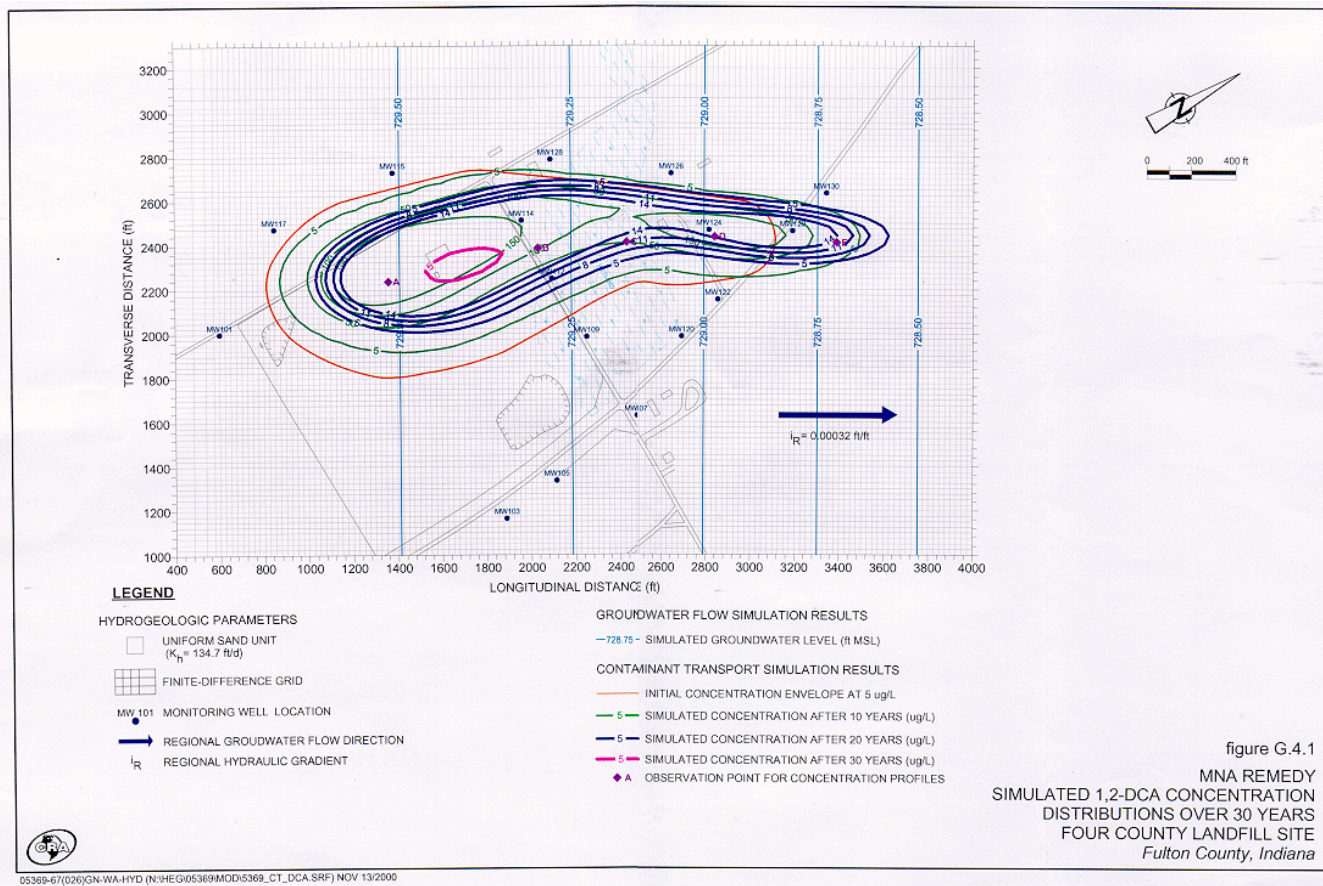


FIGURE 3. 1,2 DCA ConcentrationDistributions over 30 years

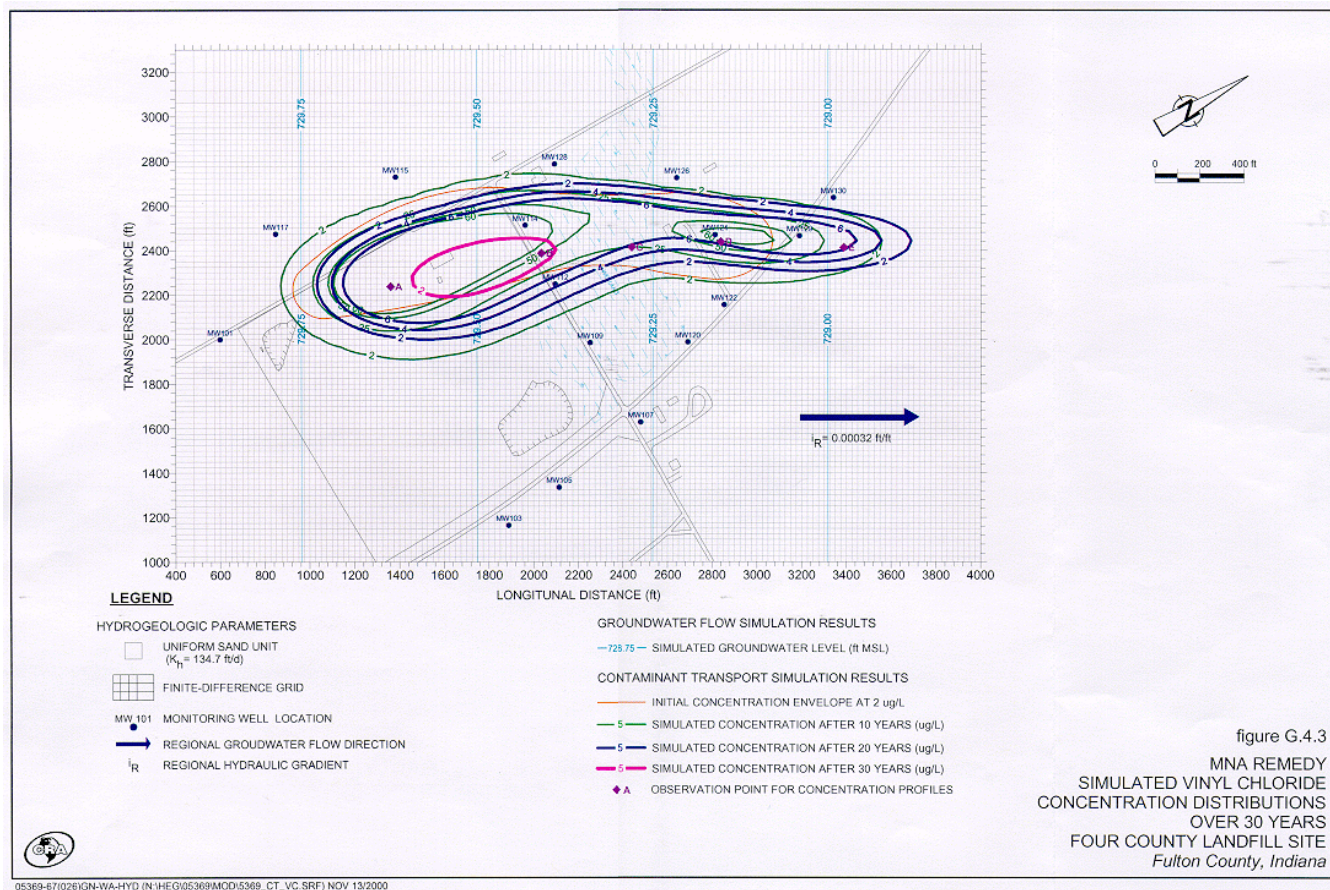


FIGURE 4. Vinyl Chloride Concentrations over 30 years

to as reductive dechlorination.

Figure 2 shows the present aerial extent of the off-site groundwater contaminant plume at the Four County Landfill.

Figures 3 and 4 show computer simulated concentration distributions of 1,2-DCA and vinyl chloride respectively at 10, 20 and 30 years for the MNA remedy. Under the conditions simulated, the 1,2-DCA and vinyl chloride plumes expand to slightly over 1600 to 1700 ft. beyond the landfill boundary, respectively. Between 25 and 30 years, it is expected that concentrations for both contaminants will fall below the groundwater MCLs (5ppb for 1,2-DCA and 2ppb for vinyl chloride) for the entire contaminant plume.

IDEM proposes to require additional monitoring points (wells) in order to fully track and assess the groundwater contaminant plume over time and to be protective of public health and the environment. Also, several select residential wells in the area will be monitored during the course of the remedial action for additional protectiveness. In the event that any site related contaminants are detected in any residential well, point of use filters will be installed.

Data will be collected in regular intervals to assess the effectiveness of the remedy. Should the data collected over time show that MNA does not continue to be an effective remedy, a groundwater contingency remedy would have to be developed and ready for implementation within one calendar year after the date of a determination by IDEM that the MNA remedy is not meeting or will not meet RAOs.

After every five years, IDEM will conduct a review of the remedy in order to insure that it remains protective of public health and the environment.

More On Monitored Natural Attenuation (MNA):

According to the U.S. EPA, the term monitored natural attenuation refers to the reliance on natural attenuation processes (within the context of a carefully controlled and monitored cleanup

approach) to achieve site-specific remedial objectives within a time frame that is reasonable compared to other methods. The natural attenuation processes that are at work in such a remediation approach include a variety of physical, chemical, or biological processes that, under favorable conditions, act without human intervention to reduce the mass, toxicity, mobility, volume or concentration of contaminants in soil or groundwater. These in-situ processes include, biodegradation, dispersion, dilution, sorption volatilization, and chemical or biological stabilization, transformation, or destruction of contaminants.

MNA is sometimes mislabeled as a “do-nothing” or “walk-away” approach to site cleanup. The truth is that MNA is a proactive approach that focuses on the verification and monitoring of natural remediation processes rather than relying on “engineered” processes.

Before MNA can be proposed for site cleanup, significant soil and groundwater data must be collected and evaluated to document that natural attenuation is occurring and to estimate the effectiveness of natural processes in reducing contaminant processes over time. The party responsible for site cleanup must commit to long term monitoring to verify that the contaminants pose no risk to human health or the environment and that natural processes are reducing contaminant levels and risk as predicted. Land use and groundwater use are usually controlled at these sites to prevent human exposure to contaminants. Further, responsible parties must commit to the implementation of a contingency remedy should MNA prove ineffective towards meeting the RAOs over time.

The Next Step:

IDEM will consider public comments received during the public comment period before final selection of the OU2 remedy. Public comments are an important part of this process as proposed cleanup decisions have changed in the past based upon public comment. The final action will be described in a Record of Decision for OU2.

A summary of all comments and IDEM's responses will be contained in the Responsiveness summary section of the OU2 ROD, which will be available at the information repository when finalized.

After the OU2 remedy selection is final, IDEM will negotiate an agreement with the potentially responsible parties to implement the selected remedy. IDEM will be providing an opportunity to find out more about the cleanup at the Four County Landfill during a public information session to be held on January 17, 2001 from 7:00 PM to 9:00 PM. at:

Aubbeenaubee Community Bldg.
7171 West Olsen Road
Leiter's Ford, Indiana

During the availability session, IDEM will summarize the OU2 investigation and PP and will answer questions and take comments.

Anyone interested in learning more about the Four County Landfill State Cleanup Site or the Superfund Process, is encouraged to review the OU2 RI and FS reports and the OU2 PP and other documents related to the site. An Administrative Record, including the information that IDEM relied upon to evaluate the remedial alternatives for OU2 and will rely upon to select the remedy for OU2, is located in the Information Repositories. The information Repositories are located at:

Fulton County Library
Aubbee Branch
Main and River Streets
Leiter's Ford, Indiana 46945

IDEM's File Room
100 North Senate Avenue
Indianapolis, Indiana 46206

Also, you may contact Mr. Vince L. Epps, the project manager for the site, at (317) 234-0359.



INDIANA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT
100 NORTH SENATE AVENUE
INDIANAPOLIS IN 46204

67-19

USE THIS SPACE TO WRITE YOUR COMMENTS

Your input on the OU2 Remedial Alternatives for the Four County Landfill State Cleanup Site is important to us. Comment provided by the public are valuable in helping IDEM select and justify the remedial action alternatives for the site.

You may use the space below to write your comments. This form may then be folded with the address on the outside and mailed. Comments must be postmarked by February 7, 2001. If you have any questions, please contact Mr. Vince Epps (317) 234-0359 or call the toll-free number 1-800-451-6027 or 1-888-272-1080.

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Name: _____

Address: _____

City: _____

State: _____ Zip: _____

Phone: () _____ - _____

Address _____
City _____
State _____ Zip _____

Place
Stamp
Here

IDEM
OFFICE OF LAND QUALITY
ATTN: MR. VINCE L. EPPS, PROJECT MANAGER
100 NORTH SENATE AVENUE
INDIANAPOLIS, IN 46204